

## POLICY

NASA shall perform the following activities:

- Design, acquire, fabricate, inspect, test, install, repair and alter, operate, and maintain all new ground-based Pressure Vessels and Pressurized Systems (PV/S) in accordance with the applicable codes, standards, guides, and regulations.
- Certify all new ground-based PV/S in accordance with the NPD and the requirements identified in the NPR prior to operation.
- Qualify and accept flight PV/S, including qualification units, in accordance with ANSI/AIAA S-080, Space Systems-Metallic Pressure Vessels, Pressurized Structures, Pressure Components; and ANSI/AIAA S-081, Space Systems-Composite Overwrapped Pressure Vessels (COPV).
- For ground-based PV/S (including flight PV/S used to support ground operations), where it is not practical (due to age or design) to meet these requirements, evaluate, certify, and accept risk for specific operational parameters in accordance with NPR 8715.3, NASA Safety Manual, the NPD, and Center policy or procedure prior to operation.
- Document and maintain the certification status of PV/S to indicate all waivers, variances non-conformances, special constraints, or instructions required for safe operation of the PV/S.
- Ensure that PV/S are operated and maintained by skilled, adequately trained, and qualified personnel who shall be certified in accordance with NPR 8715.3, NASA Safety Manual.
- Establish a configuration management program to control the engineering and maintenance changes made to the PV/S.



## YOUR PREPAREDNESS FOR AN AUDIT OF NASA POLICY FOR PRESSURE VESSELS WITH THESE SAMPLE AUDIT GUIDE QUESTIONS.

### MANAGEMENT:

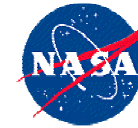
1. Does your pressure vessel policy apply to pressure systems on the ground, in flight, or both?
2. Are subcontractors, or tenant-operated, systems subject to this policy?
3. Who at your Center can approve waivers or deviations to pressure systems that are ground-based? And, for those systems that are used in flight?
4. What document establishes and documents the Pressure Vessels and Pressurized Systems (PV/S) program at your Center?
5. How does PV/S management ensure that personnel are trained, qualified, and certified to operate and maintain specific PV/S?
6. Has PV/S-responsible management ensured that the level of risk is evaluated based on probability and severity?
7. Have all PV/S in service been certified/recertified, and are periodic inspections defined?

### GENERAL POPULATION:

1. Who, at your Center, serves as the Pressure Systems Manager?
2. What is your Center's process for documenting waivers, variances, non-compliances, special constraints, and special instructions required for safe operation of PV/S?

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Publication Date March 23, 2005



## NASA SAFETY AND MISSION ASSURANCE REQUIREMENTS

### NPD 8710.5 and NPR 8715.4

## NASA Safety Policy for Pressure Vessels and Pressurized Systems

### Compliance Verification Guide



### OFFICE OF SAFETY AND MISSION ASSURANCE

This brochure is intended to be used as a guide only, not as a replacement for the actual policy. To review the NASA Safety Policies for Pressure Vessels and Pressurized Systems (NPD 8710.5 and NPR 8715.4) in their entirety, see  
<http://www.hq.nasa.gov/office/codeq/doctree/texttree.htm>.

## MINIMUM AUDIT POINTS FOR NPD 8710.5 AND NPR 8715.4

- ▶ **Center Flight Program Managers** shall designate individuals with responsibility for establishing a qualification and acceptance or recertification process to ensure safe and reliable testing and use of flight Pressure Vessel and Pressurized Systems (PV/S).
  - Objective Quality Evidence (OQE) – Letter of Designation, Organization Chart, Collateral Duties List
- ▶ **Center Directors**
  - Shall delegate an individual to serve as Pressure Services Manager (PSM).
  - OQE – Letter of Designation, Organization Chart, Collateral Duties List
  - Shall develop risk acceptance plans, approve variances, and accept the risks of operation in accordance with the NPD and the risk matrix contained in NPR 8715.3 for PV/S with Risk Acceptance Code (RAC) 1 or 2 after mitigation (residual risk).
    - OQE – Risk Acceptance Plans
- ▶ **Center or Component Facility Safety Directors** shall establish processes to review and concur in all variance requests that have safety implications and ensure that the risk documentation and communication process is consistent with NPR 8715.3.
  - OQE – Review Processes, Signatures on Variance Requests



- ▶ **Contracting Officers** impose the requirement of NPD 8710.5 on agreements, contracts, loans, acquisitions, memoranda of agreement, joint use agreements, or tenant operations.
  - OQE – Review Proposed Procurement Letters and Memorandums
- ▶ **PV/S Responsible Management**
  - Shall ensure that operating and maintenance procedures are developed and implemented to assure compliance with the operational limits of the PV/S.
    - OQE – Approved Operating and Maintenance Procedures
  - Shall ensure that personnel are properly trained, qualified, and certified (when required) to operate a specific PV/S.
    - OQE- Training and Certification Records
  - Shall ensure all PV/S are certified (or qualified/ accepted) in accordance with the NPD prior to use.
    - OQE – Certification Records
  - Shall develop a risk acceptance plan, approve variances, and accept the risks of operation for PV/S with RAC 3 or greater after mitigation (residual risk) in accordance with the NPD and the risk matrix contained in NPR 8715.3.
    - OQE – Risk Acceptance Plans
  - Shall document and maintain the certification status of PV/S to indicate all waivers variances, non-conformances, special constraints, or instructions required for safe operation of the PV/S.
    - OQE – Database or Listing of Certification Status
  - Shall recertify pressure vessels and systems in service and define periodic inspections.
    - OQE – Recertification Documentation
  - Shall ensure that the level of risk is evaluated based on probability and severity.
    - OQE – Probability and Severity Assessments

- Shall ensure that a risk acceptance plan is developed to support items such as operational and maintenance parameters, deviations from the requirements, special constraints or instructions required for safe operation, special training needs, required personnel protective equipment, inspection criteria, engineering controls, and procedural controls that must be in place prior to operation.
  - OQE – Risk Acceptance Plan
- ▶ **The Pressure Systems Manager**
  - Shall ensure that Center-specific procedures are developed and implemented for PV/S design, acquisition, construction, operation, testing, installation, alteration, repair and maintenance, inspection and certification, and documentation of non-compliance to meet the requirements of the NPD.
    - OQE – Approved Procedures Related to PV/S.
  - Shall establish processes to document all waivers, variances, nonconformances, special constraints, or instructions required for safe operation of PV/S.
    - OQE – Process Database or Listing of Waivers, etc.
  - Shall direct the application of NPD 8710.5 to non-NASA-owned PV/S that pose risks to NASA personnel, facilities, equipment or property.
    - OQE – Contract or Agreement
  - Shall review and concur/nonconcur with variance requests and forward to the Center Director or responsible organization for acceptance.
    - OQE – Variance Request Signatures
  - Shall evaluate and certify PV/S prior to each operation.
    - OQE – Evaluation Documentation
  - Shall establish configuration management programs to control the engineering and maintenance changes made to PV/S.
    - OQE – Configuration Management Plan
  - Shall ensure that system and component checks are performed on a continuing systematic basis.
    - OQE – Work Logs